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REMARKS

Claims 1-4 were pending in the application. Claims 1-4 have been amended. Accordingly, claims 1-4 are presently being examined.

Section 1 of the Office Action rejected claims 1-4 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. According to the Office action, claims 1-4 are written in a narrative format rather than an objective format and thereby fail to positively and directly include all the process steps which are referred thereto.

Applicants hereinabove have amended claims 1-4 to more clearly recite the subject matter of the present invention by: (1) positively and directly reciting each step in an objective format, for example, "accelerating the casting speed" instead of 'a casting speed acceleration step'; (2) providing an antecedent basis for "casting speed"; and (3) more clearly reciting that "rotating the rolls" occurs when "the molten metal begins to pour from the tundish hole". Support for these amendments can be found, inter alia, from page 7, line 33 to page 8, line 28, in Fig. 4, and on page 6 in lines 27-30 of the present specification. Accordingly, applicants respectfully submit that amended claims 1-4 are no longer indefinite.

In view of the amendments to claims 1-4 and the remarks above, applicants respectfully request that the rejection of

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these claims under 35 U.S.C. §112, second paragraph, be reconsidered and withdrawn.

Sections 2-4 of the Office Action rejected claims 1-4 under 35 U.S.C. 103(a) as being unpatentable over Republic of Korea Patent Publication No. 2002-017028 to Kim et al. ("Korea publication") and Japan Patent Publication No. JP 6-315742 to Yamagami et al. ("Japan publication").

According to the Office Action, the Korea publication substantially shows the invention as claimed except for a starter strip for starting the twin roll casting process. However, the Office Action also states that the Japan publication shows a starter strip to facilitate the starting step in a twin roll casting process, and therefore, using the starter strip of the Japan publication with the method of the Korea publication would have been obvious in view of the advantage of a starter strip. With respect to claims 2 and 4, the Office Action states that the optimal casting process parameters could be found through routine experimentation and are therefore obvious.

Applicants respectfully submit that the Korea publication, which was also invented by the same inventors of the present invention, starts casting by disengaging the stopper from the tundish hole of the tundish simultaneously with the commencement of the rotation of the twin roll of the strip casting apparatus. In other words, to initiate casting in the invention of the Korea publication, two actions are required to be started at the same time: disengaging the stopper, and rotating the rolls....

However, to keep the stopper securely engaged in the

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tundish hole 6 of the tundish 3 by a force strong enough to prevent outflow of the molten metal from the tundish 3, the stopper 5 is mechanically bent. Consequently, the tundish hole of the tundish 3 is closed (no molten metal can flow) until the bending phenomenon of the stopper 5 is resolved when the stopper 5 is disengaged from the tundish hole, see page 6 in lines 6-11 of the present specification. Thus, a time gap exists between the time when the stopper is disengaged and the time the molten metal flows through the disengaged stopper and reaches the roll nip.

Because of the simultaneous start of the stopper disengagement and the rotating of the rolls, the twin rolls of the strip casting apparatus of the Korea publication 'rotate vacantly' up to the time when molten metal reaches the roll nip. This vacant rotating allows a significant length of the dry leader strip to pass through the twin rolls during the time gap. Accordingly, the length of the leader strip needs to be longer due to the "vacant rotation". Further, as sometimes happens, if enough of the leader strip passes through the roll nip before the molten metal is poured, molten metal may flow out of the twin rolls which leads to the suspension of the operation.

In contrast, the present invention as recited in the amended claims only rotates the twin rolls of the strip casting apparatus when the position of the stopper 5 is "higher than the position where the molten metal (rod-offset) begins to pour from the tundish hole", that is, after the stopper 5 is completely disengaged from the tundish hole. More specifically, only from the time t_1 at which the position of the stopper 5 is higher

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than r_0 , are the rolls rotated at a prescribed speed, see page 5, line 32 to page 6, line 2 of the present specification. In other words, the present invention as recited in the amended claims does not make the rolls rotate from when the disengaging the stopper begins, but instead waits during the time to resolve the mechanical bending phenomenon up to the rod-offset time when the molten metal flows and reaches up to the roll nip of the strip casting apparatus. Therefore, the precise timing of when to draw the cast strip can be determined by separating the time when the stopper is disengaging from the time when the twin rolls are rotated as recited in the amended claims.

Accordingly, the present invention has the following advantages over the Korea publication: (1) the leader strip can be shortened corresponding to the above time gap; (2) unnecessary roll resistance force (RSF) is reduced since the leader strip can be shortened; and (3) the cost of leader strip, being shorter, is reduced.

The Japan publication, like the Korea publication, also opens the stopper in a tundish, at the same time rotation of the cooling rolls is started. Accordingly, as discussed above, the length of the leader strip (dummy sheet) must be longer than the leader strip of the present invention or molten metal, not solidified, may flow through the twin rolls which are rotating vacantly from the start. In other words, in contrast to the Japan publication, and as discussed above, the time at which the twin rolls start to rotate in the present invention as recited in the amended claims is different from the time the stopper of the tundish begins to open.

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Further, since most functions can be processed on the basis of a computer algorithm, precise setting of a time to draw the leader strip after solving the mechanical bending is possible and thus, the leader strip can be optimally shortened. This shorter length of the leader strip reduces redundant roll repulsive force (RSF) and the strip-drawing process can be economically carried out under the present invention. In contrast, the Japan publication only relates to a starting method for a thin sheet continuous caster, not an entire strip-drawing process including rolling force control. Therefore, the Japan publication is different from the present invention as recited in the amended claims at least in failing to teach or suggest such rolling force control.

Thus, applicants respectfully submit that amended claim 1, and amended claims 2-4 which depend upon amended claim 1 and are subject to all of the limitations of amend claim 1, are not taught or suggested by the Korea publication or the Japan publication taken alone or in combination.

In view of the remarks above, and the amendments of claims 1-4, applicants respectfully request that the rejection of claims 1-4 under 35 U.S.C. §103(a) be reconsidered and withdrawn.

In view of the remarks above, and the amendments to claims 1-4, applicants respectfully request that the rejections and objections in the Office Action be reconsidered and withdrawn, and earnestly solicit a Notice of Allowance.

If a telephone interview would be of assistance in advancing prosecution of the subject application, applicants'

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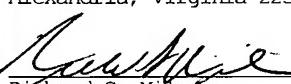
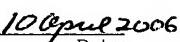
undersigned attorney invites the Examiner to telephone him at the number provided below.

No fees, other than the fee for a one-month extension of time, are deemed necessary in connection with the filing of this Amendment. However, if any such fees are required, authorization is hereby given to charge the amount of any such fees to Deposit Account No. 03-3125.

Respectfully submitted,


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